

Potential Z-Fighting Conflict Detection System in 3D Level Design Tools

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Abstract. Z-Fighting is an effect that happens in 3D scenes when two co-planar surfaces share similar values in the z-buffer which leads to flicking and visual artifacts during the rendering process due to conflicting order of rendering the surface. However in 3D level design, scenes created by the tools can be complex, in which level designers can inadvertently place co-planar surfaces that would be susceptible to z-fighting. Level designers typically notice the z-fighting artifact through visual inspection through the usage of a 3D walkthrough test on the scene which is time-consuming and easy to miss. To solve the issue, a proposal of a z-fighting detection system for level design tools is proposed to streamline the process of detecting potential hotspots where z-fighting conflicts may occur from co-planar objects.

Keywords: Z-Fighting, Level Design Tools, 3D Graphics, Computer Graphics, 3D Production Pipeline

1 Introduction

Level design is an important part of creating 3D games, virtual reality applications, 3D walkthroughs, and serious games, and other forms of interactive 3D scenes[1][8]. To aid with the process, tools such as 3D level designs tools were created to help the level designer design 3D levels and scenes to use in their applications. Over the years, 3D level design tools have increased in functionality and complexity, making it possible for level designers to design more complex scenes. Though level design tools have improved over the years, there are still a number of outstanding issues that can cause visual artifacts in the final scene in which typical level design tools cannot detect in the design process.

One of the potential visual artifacts is when z-fighting artifacts occur[7]. When the level designer place objects that are co-planar, z-fighting conflict can occur causing visual artifacts such as flickering and inconsistently merging textures. Z-fighting and their resultant effects are highly visible to the end-user and is detrimental to the overall experience of the applications and should be avoided if possible.